**RESIDENTIAL HEAT LOSS AND HEAT GAIN CERTIFICATION**
**FORM FOR FORCED AIR SYSTEMS (PER ZONE)**

1. Custom House Address or Masterfile house type:_____
   Name of Subdivision:_____ Total Floor Area:_____ S.F.
   Building Permit #_____ Q or R #_____ Zone #_____

2. HVAC Contractor:_____ License #_____
   Address:_____ City:_____ State:_____ Zip:_____
   Telephone:_____ Designer:_____
   Signature:_____ Designer License #_____

3. **Winter Design Conditions:** *note 2 Outside:_____ °F Inside:_____ °F
   A. Total calculated heat loss = _____Btuh *note 1
   B. Heat loss per S.F. floor area = _____Btuh ÷_____S.F. = _____Btuh/S.F.
   C. Heat Factor = cfm capacity of equipment in heating mode / total heat loss of the zone = _____

4. **Summer Design Conditions:*** note 3 Outside:_____ °FDB_____°FWB Inside:_____ °FDB
   A. Total calculated heat gain = _____Btuh *note 1
   B. (Structure) Total sensible gain = _____Btuh *note 1
   C. Heat gain per S.F. floor area = _____Btuh ÷_____S.F. = _____Btuh/S.F.
   D. Cooling factor = cfm capacity of equipment in cooling mode / total sensible heat gain of the zone = _____

5. **Equipment Data:**

A. Heating: Manufacturer
   Model No._____
   Input:_____ Btuh
   Output:_____ Btuh
   Type Fuel:_____ Auxiliary Heat:_____ KW
   Heat Pump Output @ Outdoor Winter Design Temperature of 10°F:_____Btuh
   Fan CFM:_____

B. Cooling: Manufacturer
   Model No.:_____
   Total Capacity @ Evaporator:_____ Btuh
   Sensible Capacity (equipment):_____Btuh
   Fan CFM:_____

C. Combustion Air Information *note 5
   Duct(s) Size From Outdoors:_____
   Ducted to Unit Return ☐ Yes ☐ No
   High/Low Grill Provided ☐ Yes ☐ No
   Water Heat Btuh:_____

***NOTES:**

1. All loads are to be calculated using ACCA's Manual 'J', ASHRAE Handbook of Fundamentals, or other recognized methods.
2. Minimum winter design conditions: Outside 10°F; Inside 72°F (wind not exceeding 15 mph); 4501 Annual Heating Degree Days.
3. Minimum summer design conditions: Outside 92°FDB; 77°FWB; Inside 78°FDB
4. All added ventilation air and unfinished areas are to be included in the load calculations.
5. Combustion air for all fuel fired equipment shall be provided by the combined use of indoor and outdoor air as required for unusually tight construction per Chapter 7 of the *2000 International Mechanical Code*, Chapter 17 of the *2000 International Residential Code* or other approved methods.
6. The County reserves the right, per Section 111.5.2 of the *Virginia Uniform Statewide Building Code*, to request a full HVAC heat loss, heat gain, and energy envelope calculations and plans where deemed it necessary.

# CFM GUIDE FOR DUCT SIZING

| ROUND DUCT | | OUTLET SIZE WALL OR CEILING | | OUTLET SIZE FLOOR | |
|---|---|---|---|---|---|
| 4″ | 40 CFM | 8X4 | 80 CFM | 2X10 | 85 CFM |
| 5″ | 65 CFM | 10X4 | 80 CFM | 2X12 | 100 CFM |
| 6″ | 120 CFM | 12X4 | 100 CFM | 2X14 | 125 CFM |
| 7″ | 165 CFM | 14X4 | 125 CFM | 4X10 | 150 CFM |
| 8″ | 240 CFM | 8X6 | 100 CFM | 4X12 | 175 CFM |
| 9″ | 320 CFM | 10X6 | 125 CFM | 4X14 | 225 CFM |
| 10″ | 420 CFM | 12X6 | 175 CFM | | |
| 12″ | 675 CFM | 14X6 | 200 CFM | | |
| 14″ | 1000 CFM | | | | |
| 16″ | 1450 CFM | | | | |

## RETURN GRILLE SIZES

| | | | | | |
|---|---|---|---|---|---|
| 10X10 | 250 CFM | 12X10 | 350 CFM | 12X12 | 400 CFM |
| 14X14 | 600 CFM | 16X16 | 750 CFM | 18X18 | 900 CFM |
| 20X20 | 1100 CFM | 24X20 | 1400 CFM | 24X24 | 1600 CFM |

6. **Air Distribution: ***note 1, 2

| Room | Area S.F. | CFM Heating | CFM Cooling | Quantity and Outlet Size | Quantity and Feeder Duct Size | Heat Loss Btu/h | Sensible Heat Gain Btu/h | Return Air Duct | Return Air Grille |
|---|---|---|---|---|---|---|---|---|---|
| Basement | | | | | | | | | |
| Rec Room | | | | | | | | | |
| Foyer | | | | | | | | | |
| Kitchen | | | | | | | | | |
| Fam. Rm. | | | | | | | | | |
| Liv. Rm. | | | | | | | | | |
| Din. Rm. | | | | | | | | | |
| Den | | | | | | | | | |
| Bdrm. 1 | | | | | | | | | |
| Bdrm. 2 | | | | | | | | | |
| Bdrm. 3 | | | | | | | | | |
| Bdrm. 4 | | | | | | | | | |
| Hall 1 | | | | | | | | | |
| Hall 2 | | | | | | | | | |
| Walk-in Closet | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Bath 1 | | | | | | | | | |
| Bath 2 | | | | | | | | | |
| Bath 3 | | | | | | | | | |
| | | | | | | | | | |
| TOTAL | | | | | | | | | |

***NOTES:**

1. All ductwork is to be designed and installed per the *Virginia Uniform Statewide Building Code*.
2. Separate certification and air distribution forms are required for each zone in multiple zone houses.